

DEPARTMENT OF THE ARMY  
UNITED STATES ARMY DENTAL ACTIVITY  
Fort Huachuca, Arizona 85613-7040

DENTAC Pamphlet  
No. 40-2

23 September 1998

Medical Services  
RADIATION PROTECTION AND QUALITY ASSURANCE PROGRAM

	<u>Para</u>	<u>Page</u>
HISTORY .....	1	1
PURPOSE.....	2	1
SCOPE.....	3	1
REFERENCES .....	4	1
RESPONSIBILITY .....	5	1
GENERAL.....	6	3
EQUIPMENT CARE/INSPECTION .....	7	4
LEAD APRON .....	8	5
RADIOGRAPHIC.....	9	5
INFECTION CONTROL .....	10	5
TRAINING .....	11	6
QUALITY IMPROVEMENT .....	12	6

1. HISTORY. This is the first printing of this publication.
2. PURPOSE. The purpose of this pamphlet is to establish guidance and procedures for the Radiation Protection Program for the USA DENTAC.
3. SCOPE. This pamphlet is applicable to all personnel who may be exposed to ionizing radiation while working under the operational control of the USA DENTAC, Fort Huachuca, Arizona.
4. REFERENCES.
  - a. AR 40-14, Occupational Ionizing Radiation Personnel Dosimetry, 30 June 1995.
  - b. TB MED 521, Management and Control of Diagnostic X-Ray, Therapeutic X-Ray, and Gamma Beam Equipment.
  - c. DENCOM Commanders' Guide, April 1998.
5. RESPONSIBILITY.

a. Commander, USA DENTAC, is responsible for establishment and enforcement of radiation protection and dental radiology policies and procedures.

b. Radiation Protection Officer. The DENTAC Radiation Protection Officer will be appointment in writing by the commander and will exercise staff and operational supervision of clinical radiology and the Radiation Protection Program (RPP) IAW AR 40-14. These duties include the following:

(1) Provide consultation on radiation exposure limits, work procedures, and individual responsibilities for the purpose of minimizing and documenting occupational exposure to sources of ionizing radiation.

(2) Investigate or assist in the investigation of excessive exposures or potential overexposure to ionizing radiation.

(3) Perform quarterly quality improvement reviews.

(4) Review annually all standing operating procedures (SOPs) for operations involving sources of radiation.

(5) Review proposals for new radiation equipment or modification/extensive repair to existing equipment.

(6) Terminate, with the approval of the DENTAC commander, any procedures involving the use of a radiation producing material or device, which is found to be a threat to health or property.

c. Radiation Protection NCO.

(1) Supervise the clinic radiological quality improvement program and ensure compliance with the radiologic QA requirements identified in the current Commanders' Guide.

(2) Provide training to personnel in proper radiographic techniques and quality improvement standards to ensure that all occupational radiation exposures are maintained as low as reasonable achievable.

(3) Ensure that proper safety standards are being followed by all personnel.

(4) Review retake log weekly and report evidence of excessive retakes to the radiation safety officer.

(5) Inspect the x-ray suite and equipment as needed, but at least weekly, to ensure that it is properly maintained in accordance with quality improvement standards.

d. Technicians. Each technician is responsible for complying with the guidelines established in this pamphlet.

## 6. GENERAL.

a. No radiographic examinations will be performed unless requested by a dental officer. Radiographs requested should reflect the clinical exam and medical/dental history.

b. The x-ray room door shall be closed while exposures are made.

c. The operating time switch must be positioned to prevent the operator from being exposed to the primary beam or scatter radiation during exposures.

d. Dental personnel will not hold films for exposure on any patient. If necessary, a parent or guardian may hold a film for a child, but they must wear a lead apron during the exposure, and stand out of the beam path.

e. Technician must be competent to take films of diagnostic quality using all means possible to minimize retakes due to patient, operator, or mechanical factors.

f. Retakes will be recorded in a log including the following information: Date, patient's name and SSN, examination type, reason for retake and technician's name. The log should be reviewed weekly by the Radiation NCO. Appropriate instructions to technicians and/or equipment repairs will be made to reduce the number of retakes to the lowest number possible.

g. A daily evaluation of chemistry potency will be made by use of the Radiographic Normalizing Device (RND) or step wedge for each processor. A size 2 film will be exposed at the setting used for adult bitewing film exposure. The film will be processed in the normal manner and compared to the sample films on the RND to determine if it falls within the acceptable range or, in the case of the step wedge, to assure that it exhibits proper range of contrast. Discrepancies from acceptable should be noted and steps to correct unit calibration or chemistry taken. If available, a sensitometer and densitometer should be used to determine speed contrast and base plus fog IAW TB MED 521.

h. A technique chart showing exposure time, kVp, and mA settings will be posted adjacent to the control panel.

i. A long cone (16") and a paralleling technique are the methods of choice for taking intraoral radiographs. A 90 kVp setting should be used whenever possible to reduce patient exposure. Bitewing and endodontic radiographs may be exposed at a lower kVp setting (e.g., 75 kVp) to enhance contrast.

j. Tube heads will not be altered to increase x-ray beam size by the removal of collimators or the x-ray tube.

k. Appropriate warning signs, i.e., X-RAY and INFORM TECHNICIAN IF YOU THINK YOU MAY BE PREGNANT, should be posted in English.

l. Eye lavage stations should be flushed weekly for 4 minutes to ensure proper operation and prevent bacterial growth.

## 7. EQUIPMENT CARE/INSPECTION.

a. The maintenance and operation of dental x-ray equipment will be done in accordance with manufacturers' recommendations.

b. Operators will make a daily visual check to ensure proper maintenance and repair of all equipment to include tube heads, the control panel, and the film processor.

c. Film Processor.

(1) Daily--Turn on processor, allow 15 minutes to reach operating temperature (25-31 degrees C), check water and chemical temperature, chemical levels, processor cleanliness, replenisher fluid levels and any loose replenishing line connections. Run a cleaning film through the processor to remove mineral accumulations. New films may now be processed. Solutions should be replenished after 84 intraoral films or 6 panographs by turning the processor on and off or turning the replenisher power switch to the on position for 10 seconds. At the end of the day, shut down the processor by turning off the water supply, and propping the lid open.

(2) Weekly--Remove each track and rinse under warm water.

(3) Protective face masks, aprons, rubber gloves, and safety glasses will be worn when cleaning the film processor and mixing chemicals.

d. Used fixer will be processed through the silver reclamation processor and turned in when full.

f. View boxes will be inspected quarterly for consistency of light output.

g. All required operator inspections will be recorded on appropriate forms for review by the Radiation NCO.

## 8. LEAD APRON.

a. Shielding of the patient's chest, abdomen, genital areas, and thyroid gland by use of a lead apron will be routinely performed on all patients. An exception to using the thyroid shield is when it prevents proper film exposure (e.g., panographs).

b. Lead aprons must have a lead equivalent of 0.25 mm of lead.

c. Aprons must not be folded sharply, but be hung on a holder for this purpose so that their protective properties are not damaged.

d. Document fluoroscopic inspection of lead aprons semiannually to ensure integrity by the radiology department.

#### 9. Radiographic Film.

a. For periapical and bitewing radiographs, only film of an American National Standards Institute Speed Group "D" or "E" rating will be used.

b. Bulk quantities of film will be stored in the refrigerator until use.

c. Expiration dates on all film will be checked weekly.

d. Rejected x-ray films will be stored in a designated container for turn-in to DENTAC Supply.

#### 10. INFECTION CONTROL.

a. Technicians will wear gloves when placing x-ray films for intraoral techniques.

b. Contaminated films should be placed in a paper cup for transport to the darkroom for processing.

c. Contaminated tube heads, unit controls, etc. should be disinfected between patients.

d. Film holders should be soaked in an approved solution for a minimum of 10 minutes before rinsing with water and reusing.

#### 11. TRAINING.

a. All new personnel will receive an orientation on dental radiography and quality improvement by the clinic Radiation Protection NCO.

b. Documented annual training will include the following items:

(1) Safe working techniques and procedures.

(2) Proper use of protective equipment and devices.

(3) Daily pre-operational, operational, and post-operational checks or survey to ensure proper radiation safety.

c. Civilians will be required to demonstrate by evidence of training, knowledge, and clinical ability, or by successfully passing the American Dental Assisting Association examination in dental radiology, that they are competent to take dental radiographs.

## 12. QUALITY IMPROVEMENT.

a. Quality improvement inspections will be performed monthly by the clinic Radiation Protection NCO. This inspection will include those items on the radiology quality improvement checklist from the 1998 Commanders' Guide.

b. A copy of these inspections will be forwarded to the USA DENTAC Quality Improvement Committee.

The proponent agency of this publication is the Office of the Commander. Send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) to Commander, U.S. Army Dental Activity, ATTN: DSBJ-CDR, Fort Huachuca, Arizona 85613-7040.

//Original Signed By//

HARLAND G. LEWIS, JR.  
Colonel, Dental Corps  
Commanding

### DISTRIBUTION:

DSBJ-CDR - 1

DSBJ-RDC - 4

DSBJ-RDC (40)

MEMORANDUM FOR Chairman, Quality Assurance Committee, U.S. Army  
Dental Activity, Fort Huachuca, AZ 85613-7040

SUBJECT: Radiology Quality Assurance Monthly Checklist

1. Is there a documented radiologic QA program? Yes\_\_\_\_ No\_\_\_\_
2. Is the DENTAC performing quarterly checks to ensure proper marking and orientation of panoramic films? Each panoramic film must be labeled with "L" on the patient's left side and/or "R" on the right. Are the checks documented? Yes\_\_\_\_ No\_\_\_\_
3. Has the commander ensured that annual instruction has been provided in radiation protection practices and in the biologic effects and risks of ionizing radiation exposure? Yes\_\_\_\_ No\_\_\_\_
4. Has documentation been maintained indicating participation of appropriate personnel in inservices education, on the job training and outside workshops? Yes\_\_\_\_ No\_\_\_\_
5. Are technique charts, cooling curves, and tube rating charts posted? Yes\_\_\_\_ No\_\_\_\_
6. Are radiographs taken only after evaluation of pertinent history and need established by dental officer? Yes\_\_\_\_ No\_\_\_\_
7. Are all lead aprons checked/inspected at least semi-annually and checked/inspected at least annually for safety defects? Are aprons properly placed/stored when not in use to prevent damage? Yes\_\_\_\_ No\_\_\_\_
8. Are student x-ray technologists supervised? Yes\_\_\_\_ No\_\_\_\_
9. Has a radiation protection survey been conducted prior to the use of new x-ray equipment or facility? Yes\_\_\_\_ No\_\_\_\_
10. Is there a current radiation protection survey for existing facilities? Yes\_\_\_\_ No\_\_\_\_
11. Are all interlock systems, "on-off" beam mechanisms, and safety and warning devices checked and serviced at least every 6 months? Yes\_\_\_\_ No\_\_\_\_
12. Are appropriate warning signs posted? Yes\_\_\_\_ No\_\_\_\_
13. Is there a retake log which includes examination, projection, room, reason and technologist? (E.G., 1 Jan, PA #12, Endo, missed Apex, PDS.) Is this log reviewed weekly? Yes\_\_\_\_ No\_\_\_\_

14. Is there a daily evaluation of the index of speed, index of contrast, solution temperatures and base plus fog? Sensitometer /Densitometers may be used for this or a step wedge test.

Yes\_\_\_\_ No\_\_\_\_

15. When working with film processing chemicals, do personnel wear aprons, gloves, and splashproof eyewear and is there an approved emergency eye lavage available? Do conditions require an emergency shower? If so, is one available? Yes\_\_\_\_ No\_\_\_\_

16. Are DD Forms 1141 (Record of Occupational Exposure to Ionizing Radiation) or, preferably, Automated Dosimetry Records being maintained?

Yes\_\_\_\_ No\_\_\_\_

17. Is the film badge storage area designated in writing by the RPO.

Yes\_\_\_\_ No\_\_\_\_

18. Are view boxes checked quarterly for consistency of light output?

Yes\_\_\_\_ No\_\_\_\_

19. Are individual panographic cassettes radiographically identified and numbered and right or left side marked? Are evaluations of film-screen contact, screen conditions, light leaks and film-screen combinations done at least quarterly?

Yes\_\_\_\_ No\_\_\_\_

20. Is there an RPO and an A-RPO for the DENTAC? The DENTAC commander may appoint his own personnel or use MEDDAC/MEDCEN staff.

Yes\_\_\_\_ No\_\_\_\_

21. Has a qualified expert surveyed each x-ray system within the last 3 years?

Yes\_\_\_\_ No\_\_\_\_